organic or inorganic, should be within the scope of the joint Society, their inclusion in a *Mineralogical Magazine* would suggest a misnomer. The change or extension of our already lengthy title has its evident inconveniences, but it may be worthy of careful deliberation by the Society at some early date as to whether such an extension is not really necessary for the clearer definition of our objects if we are to enlist the sympathy of many who, though they may feel to be beyond the pale of a Mineralogical Society, yet by their investigation of the crystalline forms of the products of the laboratory may in the future, as in the past, throw light on the crystallography of the Mineral Kingdom.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The following gentlemen have been appointed examiners:—

Mathematical Tripos, Part II.: Dr. Routh (Chairman), Messrs. W. Burnside, J. Larmor, and A. R. Forsyth.

Natural Sciences Tripos and 2nd M.B.: Dr. Hill (Master of Downing), Prof. Cleland (Human Anatomy), Prof. Stirling, Dr. Gaskell (Physiology).

Natural Sciences Tripos: Prof. W. G. Adams, Mr. W. N. Shaw (Physics), Prof. W. A. Tilden, Mr. H. J. H. Fenton (Chemistry), Prof. Lewis, Prof. Story-Maskelyne (Mineralogy), Mr. F. Darwin, Prof. H. Marshall Ward (Botany), Mr. W. F. R. Weldon, Mr. F. S. Harmer (Zoology).

Natural Science Tripos and Special B.A.: Mr. W. W. Watts, Mr. A. Harker (Geology).

M.B. and Special B.A.: Prof. W. G. Adams, Mr. S. L. Hart (Elementary Physics), Mr. H. F. Neville and Mr. H. J. H. Fenton (Elementary Chemistry), Mr. F. Darwin and Mr. S. F. Harmer (Elementary Biology).

2nd M.B. only: Mr. Pattison Muir and Mr. H. Robinson (Pharmaceutical Chemistry).

Messrs. W. Carruthers, F.R.S., and J. E. Marr are appointed examiners for the Sedgwick Prize to be adjudged in 1892.

The University Lectureships in Botany and Advanced Human Anatomy, tenable for five years, are vacant. Candidates must send their names to the Vice-Chancellor on or before November 30.

Open Scholarships and Exhibitions will be competed for at the following Colleges, beginning on the undermentioned dates: Mathematics, Pembroke, December 11; Trinity Hall, December 11; Queens', December 12; Mathematics and Natural Science, Gonville and Caius, December 7; King's, December 10; Jesus, Christ's, and Emmanuel combined, December 11; St. John's, December 11; Trinity, December 11; Sidney Sussex, January 1. The tutors will give full information.

The Sheepshanks' Astronomical Exhibition will be competed for on December 10 and 11 at Trinity College.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, November 15.—"Combustion in Dried Oxygen." By H. Brereton Baker, Dulwich College, late Scholar of Balliol College, Oxford. Communicated by Prof. H. B. Dixon, F.R.S.

In 1884, some preliminary experiments, published in the Journal of the Chemical Society, convinced me that moisture exerted an important influence on the combustion of carbon. Since that time experiments have been made, not only with that element but with several others, and the same influence seems to be exerted on the combustion of some, while no such influence could be detected in the case of other elements. It was discovered very early in the investigation that hydrogen, both free and combined, aided the union of carbon with dried oxygen, and therefore, for the new experiments on this and other elements, special attention was devoted to their purification from hydrogen. It was found that two of these elements, amorphous phosphorus and boron, had, like carbon, a very great power of occluding hydrogen. To eliminate it some of the elements were heated in a current of pure chlorine, while others were heated in sealed tubes with the chlorides of the elements, special precautions being taken to free the purified elements from all traces of the agents used in their purification. In this way the elements—carbon, sulphur, boron, and phosphorus, the latter in both red and yellow modifications—were found to have their combustion influenced by the dryness of the oxygen. Some chemical union was found to take place, the extent of which varied with the dryness of the substances. In no case, however, did it manifest itself by flame. Ordinary phosphorus was obtained so pure as not to glow in the oxygen dried by phosphorus pentoxide, though the pressure was increased and diminished in every possible way. If water was added, rapid combustion at once set in.

The elements—selenium, tellurium, arsenic, and antimony—were purified with as much care as was expended on the elements mentioned above. Their combustion was, however, not found to be affected in any way by the dryness of the gas.

In the course of the investigation two facts were discovered about the combustion (1) of amorphous phosphorus, and (2) of carbon in oxygen. Amorphous phosphorus is generally regarded as being incapable of true combustion. It is asserted that before amorphous phosphorus can be heated to its kindling point, it changes into ordinary phosphorus, which then burns. This has been proved not to be the case. Amorphous phosphorus was heated in a current of nitrogen, free from traces of oxygen, to 260°, 278°, and 300° in three experiments, without undergoing any change to the ordinary modification. If moist oxygen was substituted for the nitrogen, combustion took place at 260°. It seems, therefore, probable that amorphous phosphorus undergoes a true combustion in oxygen without previous change to the ordinary modification.

With regard to the combustion of carbon, it has always been a doubtful question which of the two oxides is first formed. Is carbon monoxide the first product, undergoing further oxidation to the dioxide, or is carbon dioxide the first and only substance formed? The problem seems incapable of direct solution. It is, however, open to indirect attack. When carbon is heated in a current of partially dried oxygen, a slow combustion goes on, and, though the oxygen is in excess, both oxides are produced. The amount of monoxide, however, is twenty times the amount of the dioxide. Experiments also show that this occurs at temperatures at which dry carbon dioxide is not reduced by carbon. The carbon monoxide must, therefore, be produced by the direct union of its elements, its further oxidation being prevented by the dryness of the gases. Confirmatory experiments were performed in which carbon monoxide was found to be produced by the slow combustion of carbon in air at 440°, a temperature too low for the reduction of the dioxide by carbon. It is probable that the ordinary combustion of carbon goes on in two stages, that carbon monoxide is first produced, and, if circumstances are favourable, this is further oxidized to carbon dioxide.

"On the Secretion of Saliva, chiefly on the Secretion of Salts in it." By J. N. Langley, M.A., F.R.S., Fellow of Trinity College, and H. M. Fletcher, B.A., Trinity College, Cambridge.

Heidenhain has shown that when saliva is obtained by stimulating the chorda tympani, the percentage of salts in the saliva depends upon the rate of secretion, so that the faster the secretion the higher the percentage of salts is up to a limit of about 0·6 per cent.

The authors do not find any rate of secretion beyond which an increase in rate fails to increase the percentage of salts in the saliva. The increment in the percentage of salts decreases, however, with each equal successive increment in the rate of secretion.

As a rule, in saliva obtained by injecting pilocarpine, the percentage of salts follows Heidenhain's law; the exceptions are probably due to the action of pilocarpine upon the circulation.

The percentage of salts in saliva obtained by stimulating the sympathetic is higher than corresponds to its rate of secretion, the saliva obtained by stimulating the chorda being taken as a basis of comparison; this sympathetic saliva may be secreted at $\frac{1}{180}$th of the rate of chorda saliva, and yet contain very nearly as high a percentage of salts.

Dyspnœa decreases the rate of secretion of saliva with a given stimulus, and if not too prolonged, increases the percentage of salts, and tends to increase the percentage of organic substance in the saliva.

Clamping the carotid during secretion has the same general effect as dyspnœa, but it causes a still more marked increase in the percentage of salts. Its after-effect is also much greater, and lasts longer.

Bleeding has a similar effect to dyspnœa and to clamping the carotid, but its most marked effect is an increase in the percentage of organic substance.

Injection of dilute salt solution, NaCl, 0·2 to 0·6 per cent., in sufficient quantity, considerably increases the rate of secretion of saliva; the percentage of salts in the saliva decreases, although the rate of secretion of salts usually increases; the percentage of organic substance decreases; that is, increasing the volume of the blood with dilute salt solution chiefly increases the rate of secretion of water.

Injection of strong salt solution increases the percentage of salts in saliva. This is in accordance with the recent observations of Novi, that the chlorine in the salts of saliva is increased for a given rate of secretion by increasing the percentage of sodium chloride in the blood.

Saliva produced by stimulating the chorda tympani, or by injecting pilocarpine, after a small dose of atropine has been given, contains a low percentage of organic substance and of salts.

The authors, like Werther, find that sub-lingual saliva has a considerably higher percentage of salts than sub-maxillary saliva.

If lithium citrate, potassium iodide, potassium ferrocyanide, and pilocarpine are injected into the blood, lithium can be detected in the first drops of saliva secreted, potassium iodide after the first six drops; potassium ferrocyanide cannot be detected at any stage of secretion.

The general result of these experiments is to show that the secretion of water, of salts, and of organic substance are differently affected by different conditions, and that the percentage composition of saliva is determined by the strength of the stimulus, by the character of the blood, and by the amount of blood supplied to the gland.

All, or nearly all, the arguments which have been adduced to prove that the secretion of organic substance is governed by special nerve-fibres, have their counterparts with regard to the secretion of salts, so that we might imagine at least three kinds of secretory fibres to be present. The experiments, on the whole, indicate that this complicated arrangement does not exist, but that the stimulation of a single kind of nerve-fibre produces varying effects according to the varying conditions of the gland cells.

Linnean Society, November 15.—Mr. W. Carruthers, F.R.S., President, in the chair.—On behalf of Mr. H. Bolus, Mr. J. G. Baker exhibited a specimen of *Eriospermum folioliferum*, a plant showing a very remarkable type of leaf-structure. It was figured by Andrews in his "Botanist's Repository" in 1807, and lost sight of until recently refound by Mr. Bolus in Namaqualand.—Prof. Stewart exhibited a substance which had been picked up on the sea-shore, the nature of which it had puzzled many to determine, its structure being regarded by some as animal, by others as vegetable. He proposed to submit it to careful microscopical examination.—Mr. J. E. Harting exhibited a South American bat from Trinidad (*Noctilio leporinus*), alleged to be of piscivorous habits, and remarked upon a similar habit which had been observed in a species of *Pteropus* in India.—A paper was read by Mr. B. D. Jackson, on behalf of Mr. H. Chichester Hart, on the mountain range of plants in Ireland, and was criticized by Mr. J. G. Baker, who gave an interesting sketch of the characteristics of the Irish flora.—Two papers were then read, by Mr. Sladen, on the mammals and birds collected by Mr. H. N. Ridley in Fernando Noronha, in the determination of which the author had been assisted by Mr. O. Thomas and Mr. R. B. Sharpe.

Physical Society, November 10.—Prof. Reinold, President, in the chair.—The following communications were read:—On the calculation of the coefficient of mutual induction of a helix and coaxal circle, by Prof. J. V. Jones. In arranging some experiments for determining resistance absolutely by Lorenz's method, the author had occasion to consider what form of standard coil was most suitable for accurate calculation, and chose a helix of large diameter with a single layer of wire. To obtain a sufficient number of turns requires considerable axial length, and Lord Rayleigh's approximate method of calculating the coefficient was found to be insufficient where an accuracy of 1/100 per cent. is required. A method of calculation is given considering the wire as a helix whose equations are $y' = \mathrm{A} \cos \theta'$, $z' = \mathrm{A} \sin \theta'$, and $x' = k\theta$, those of the circle being $y = a \cos \theta$ and $z = a \sin \theta$. Applying the formula obtained to a circle of 10 inches diameter placed concentric with a helix of 20 inches diameter and 4 inches long, the value obtained is $\mathrm{M} = n \,.\, 53{\cdot}259$, whereas Lord Rayleigh's formula gives $n \,.\, 53{\cdot}317$. Dr. Fleming described a wooden anchor ring wound like a gramme armature, and having a secondary coil added, which he had devised as a standard of mutual induction, and used for determining capacity absolutely. In reply, the author said he had not considered the wire to have thickness, as he felt sure this would not affect the result for his coil by one part in 100,000. With respect to Dr. Fleming's anchor ring, he considered the difficulty of winding it sufficiently uniformly to be a great drawback to its general adoption.—On the upper limit of refraction in selenium and bromine, by Rev. T. Pelham Dale, read by Mr. Baily. In a former paper (read February 11, 1888) the author showed that an upper limit of refraction for selenium should theoretically exist about the middle of the visible spectrum, and the present communication describes some experiments which tend to confirm the prediction. On placing a thin film of selenium under a spectro-microscope, it was found to be opaque to rays above the green, and previous calculation had given 5295·7 as the limiting wave-length transmissible. Sulphur at ordinary temperatures should have its upper limit beyond the visible spectrum, but theory indicates that increased temperature will lower the limit. It is well known that sulphur darkens when heated, and when a film of boiling sulphur was examined under the spectro-microscope, all but the red end of the spectrum was absorbed. On cooling, the region of absorption gradually retreated towards the violet end. Selenium is also found to become more transparent as it is cooled, and its refractive equivalent is equal to that of sulphur multiplied by the ratio of its chemical equivalent to its density. Important optical as well as chemical relations thus exist between the two elements. The results obtained by bromine films were remarkably similar to those of selenium, the violet rays being entirely cut off. A method of solving the equation $a \sin \theta = \sin m\theta$ (on the limiting solution of which the upper limits of refraction depends), by a table of Eulerian integrals, is given in the paper, and an analogy between total reflection and the upper limit of refraction is traced.—Experiments on glass in polarized light, by Prof. S. P Thompson.—On a new form of standard resistance coil, by Dr J. A. Fleming.

Chemical Society, November 1.—Mr. W. Crookes, F.R.S., President, in the chair.—The following papers were read:—The constitution of the terpenes and of benzene, by Prof. W. A. Tilden, F.R.S. When oxidized under similar conditions with dilute nitric acid, the natural terpenes—australene, terebenthene, and hesperidene—yield less than 2 per cent., dipentene (terpilene) yields 27·6 per cent., and cymene and paraxylene yield 73 to 80 per cent. of paratoluic acid. Each of the four terpenes combines with two molecular proportions of bromine, and no more. Camphene, however, does not combine with bromine, and hence must be regarded as saturated in the usual sense. The author concludes that since the terpenes contain at most four units of available combining capacity, the nucleus of six carbon atoms which they all undoubtedly contain must be united into a closed chain containing at the most two double "bonds." Kekulé's benzene formula is a well-known representation of a ring of six carbon atoms, but must be abandoned, since the author considers that the terpenes are certainly not benzene derivatives. Kekulé's formula is open to the objection that it represents benzene as containing "ethylenic" carbon, for which there is no evidence at all. Moreover, a body of this formula, when treated with nitric acid, ought to yield abundance of oxalic acid. This the terpenes do, but the benzenoid hydrocarbons do not. Referring to this last statement, Dr. Japp, F.R.S., said that phenol on oxidation with alkaline permanganate gave a considerable quantity of oxalic acid; Mr. Groves, F.R.S., added that oxalic acid is obtained in quantity on oxidation of chloranilic acid; and Dr. Perkin, F.R.S., remarked that he had obtained a quantity of oxalic acid in preparing picric acid from phenol. Dr. Perkin also said that the low magnetic rotatory power of American turpentine was a probable indication of the non-existence of a nucleus of six carbon atoms. Mr. Wynne remarked that the production of α-naphthol by the distillation of phenylisocrotonic acid, a compound in which "ethylenic" carbon was undoubtedly present, might be quoted in support of Kekulé's benzene formula; and Prof. Armstrong, F.R.S., expressed the opinion that the evidence at disposal was entirely insufficient to enable us to determine the constitution of the terpenes with any degree of probability.—Some new compounds of magnesia with the halogens, a contribution to the study of the electrolysis of magnesium chloride solution, by Messrs. Cross and Bevan. The authors find that the white substance separated at the cathode under the condition that the solution is not kept in circulation is a chloroxygen compound of magnesium, probably a magnesium hypochlorite. Similar compounds are formed on electrolyzing solutions of magnesium bromide and iodide.—The heat of dissolution of various substances in different liquids, by Mr. S. U. Pickering. The heats of dissolution of the nitrates and chlorides of calcium and lithium in water and in alcohol, and of bromine and iodine in various liquids, have been determined; and the results are held to support the author's view that the affinity of the radicles composing a salt molecule is not entirely saturated by their combination, and that the "residual affinity" of one of these radicles becomes entirely saturated by the solvent; the heat of combination of the atoms and the heat of dissolution of the molecule which they form being thus parts of the same chemical operation.—The criteria of plane and axial symmetry, by Prof. Armstrong, F.R.S. Wislicenus, in his now widely-known paper on the space arrangement of the atoms in carbon compounds, has termed compounds of the form $\begin{array}{c}\text{a.C.b}\\ \|\\ \text{b.C.a.}\end{array}$ *axially symmetric*, and those of the form $\begin{array}{c}\text{a.C.b.}\\ \|\\ \text{a.C.b.}\end{array}$ *plane symmetric*. In allocating these formulæ, he has argued, in a case such as is afforded by the two tolane dichlorides, for example, that the compound of higher melting-point (143°) is necessarily the plane symmetric modification, as it is produced on chlorinating tolane $\begin{array}{c}C_6H_5.C\\ \vdots\\ C_6H_5.C\end{array} + Cl_2 = \begin{array}{c}C_6H_5.CCl\\ \cdot\cdot\\ C_6H_5.CCl\end{array}$, and from the three possible configurations of tolane tetrachloride has arrived at the conclusion that on reduction it should yield the axially symmetric tolane dichloride in the larger quantity. Blank's experiments (*Annalen*, ccxlviii. 1) show that the two isomeric dichlorides are produced nearly in the proportion of two parts of that of lower melting-point (63°) to one of that of higher melting-point, and the axially symmetric structure is therefore, it would seem, as a matter of course, assigned by him to the dichloride melting at 63°. The author regards these views as being based on pure assumptions, and shows that all the facts at present known tend to prove that symmetric compounds—such as the para- or symmetric di-derivatives, or the symmetric tri- and tetra-derivatives of benzene, or the axially symmetric $\alpha\alpha$ or $\beta\beta$ modifications in the case of isomeric di-derivatives of naphthalene—have always the highest melting-point. The tolane dichloride of higher melting-point is therefore probably the axially symmetric modification. The majority of "alloisomerides" are compounds containing unsaturated carbon usually in association with one of the halogens or oxygen, and the author points out that it does not appear that this circumstance has yet been taken into account, or that the extent to which the peculiarities manifested by the negative elements are concerned in and may condition the isomerism has been in the least considered. The symbolic system introduced by Van 't Hoff, and adopted by Wislicenus, tends, moreover, to withdraw attention from the consideration of the possible effect of the peculiarities referred to, inasmuch as a "double bond" is represented as the precise equivalent of two, and a treble bond as that of three single bonds; which all observations show is a misrepresentation of the facts.—Derivatives of methylindole, by Dr. H. G. Colman.—Acetamide and phenanthraquinone, by Dr. A. T. Mason.—The action of ethylenediamine on succinic acid, by the same.

PARIS.

Academy of Sciences, November 19.—M. Janssen in the chair.—On the "Collection of the old Greek Alchemists," by M. Berthelot. The parts now presented to the Academy complete the publication of the Greek text and French translation of this great work. Part v. contains technical treatises of special interest on the goldsmith's art, the tempering and colouring of bronze and iron, bronze casting, iron-gilding, the preparation of gold-leaf, the colouring of artificial gems, the treatment of pearls, the preparation of lye from ashes, beer, soap, &c. Most of these treatises appear to have formed part of a great work on practical chemistry composed in the eighth and ninth centuries, and several are written in the Byzantine dialect. But some are of great antiquity, amongst others one dealing with the phosphorescence of precious stones.—On the satellite of Neptune, by M. F. Tisserand.—On the latitude of the Gambey mural circle at the Paris Observatory, by M. H. Faye. A method is proposed by which the exact latitude of the instrument itself may be directly determined, and the results controlled which have been obtained with other processes by M. Périgaud in the present year, and by others at earlier dates. M. Périgaud determines the latitude of the Observatory as 48° 51′ 10″·9.—Note on the stability of the French seaboard, by M. Bouquet de la Grye. The results of the comparative observations taken for some years past at the ports of Brest, Cherbourg, and Havre, tend mainly to confirm the general researches of Colonel Goulier. From the comparative tables it appears that the mean level diminishes in the direction from Brest to Havre; at Havre the annual subsidence seems to be about 2 mm., at Cherbourg 1 mm., at Brest nearly absolute stability.—A study of submarine navigation, by M. A. Ledieu. A survey is given of the futile efforts made in this direction previous to the invention of Whitehead's regulating pendulum in 1872; which, combined with M. Joseph Farcot's servo-motor, gave the true solution of the problem. From that time dates all real progress in submarine navigation.—On various methods of treating rabies, by M. Odo Bujwid. Since his visit to M. Pasteur's establishment in 1886, M. Bujwid has been treating persons bitten by dogs, either mad or suspected of being mad, in his laboratory at Warsaw. At first he followed the simple processes of inoculation of M. Pasteur, and of M. Frisch, of Vienna, with some failures in both cases. But during the last sixteen months he has adhered exclusively to the intensive or severe treatment, which has been applied to 370 patients without a single fatality.—Observations of Palisa's new planet (281), and of Barnard's comet (October 30, 1888), made at the Observatory of Algiers with the 0·50 m. telescope, by MM. Rambaud, Sy, and Renaux. The observations of the planet are for the period from November 3 to November 8; those of the comet from the 5th to the 8th of the same month.—On the subsidence of the land in France, by Colonel Goulier. In reply to General Alexis de Tillo's remarks on his previous note, the author points out that his conclusions on this subject are not put forward as final, but only as a probable hypothesis to be accepted until proved untenable.—On mountain-ranges and their relations to the laws of deformation of the terrestrial spheroid, by M. A. de Grossouvre. On purely theoretical considerations the author arrives at the conclusion that the zones of foldings are progressively receding southwards. This conclusion is entirely in accordance with the observed facts connected with the dislocation of the earth's crust, and the regularity of the phenomenon is regarded as a confirmation of the theory of the primitive fluidity of the globe.—On equalities of two degrees, by M. Michel Frolov. These researches have reference to the properties of groups of *n* numbers, whose first and second powers give respectively equal sums, properties which have not yet been studied by any other arithmetician.—Maximum spectrum of Mira Ceti, by Mr. J. Norman Lockyer.—On the mutual relations of meteorites and shooting-stars, by M. Stanislas Meunier.—Note on the tensions of various vapours, by M. Ch. Antoine.—On the decomposition of the haloid salts of silver under the influence of light, by M. F. Griveaux.—Hydrochlorates of benzidine: their dissociation by water, by M. P. Petit.

BERLIN.

Physical Society, November 2.—Prof. von Helmholtz, President, in the chair.—Dr. Brodhun gave an account of experiments which he had made, in conjunction with Dr. König, for the purpose of testing the fundamental law of psychophysics in connection with the sense of sight. These have already been described by Dr. König in a communication to the Physiological Society, previously reported in NATURE (vol. xxxviii. p. 464). In the discussion which ensued, the President spoke on the sensation of light derived from the resting retina (*Eigenlicht*). In connection with the preparation of the new edition of his "Physiological Optics," he had made experiments and calculations which showed that the *Eigenlicht* is much greater than has hitherto been supposed. Taking as a standard the unit used by König and Brodhun in their researches, the *Eigenlicht* has a magnitude of forty to sixty such units. It is characterized by the irregular brightness of the field of vision, giving rise to the sensation of a more or less coarsely punctated image with lighter and darker patches; it further leads to the result that with equally small intensities of illumination large objects are seen more easily than small, so that the liminal intensity (*Schwellenwerth*) for small surfaces is considerably greater than for large.—Prof. Kundt exhibited a large number of photographs of spectra which had been prepared in his laboratory with a view to testing the action of light-absorbing substances on dry-plates. Spectra photographed on dry-plates which had been coloured with chlorophyll were especially interesting. They consisted of a bright strip ending near F, followed by a dark portion intercepted by an extremely bright line at the spot where the absorption-band of chlorophyll is present in the red. Plates stained with eosin similarly showed a bright strip corresponding to the absorption-band of this substance in the yellow, whose brightness was much greater than that of the rest of the spectrum. These experiments showed that the rays of light which are absorbed by the above colouring-matters exert an extremely active chemical action on the plates. Experiments made with a view to determining whether absorption of light has a similar effect on fluorescence yielded negative results. It still remains to investigate whether the maximum brightness of the spectrum photographed on a plate stained with chlorophyll corresponds exactly with the absorption-band of this substance, taking into account at the same time the influence of the solvent used for the solution of the chlorophyll on the position of its absorption-band. Prof. Kundt then exhibited a simple form of bolometer which, based on the principle described by Dr. R. von Helmholtz at a recent meeting of the Society, may be easily and cheaply constructed out of thin tinfoil, and is specially adapted for lecture experiments. The same speaker finally exhibited two selenium cells constructed by Uljanin, of Strasburg, in July 1887, and still extremely sensitive to the action of light.

Meteorological Society, November 6.—Dr. Vettin, President, in the chair.—Dr. Kremser gave an account of meteorological observations made during a balloon voyage on June 23 of this year. For the purpose of carrying out scientific observations on the lines of Welsh and Glaisher in England, and of Tissandier in France, von Siegsfeld had constructed a balloon fourteen metres in diameter.—Dr. Assmann described some ice-filaments which he had observed in a valley of the Harz Mountains during a three days' frost in October.

Physiological Society, November 9.—Prof. du Bois-Reymond, President, in the chair.—Dr. Virchow described, as based on his own original researches, the development of the cylindrical epithelium of the yolk-sac, thus amplifying the communication made at the previous meeting of the Society on the development of the blood, blood-vessels, and yolk-sac of the chick. He distinguished seven stages in the development of the epithelium, each of which he separately described and explained by means of drawings, diagrams, and preparations, which he exhibited.—Dr. Martius made a communication on new experiments which he had carried out with a view to refuting certain attacks which had been made on his investigation of cardiograms as laid before the Society in the previous year. It may be remembered that the speaker had connected the curves traced by the impulse of the apex of the heart on a rotating cylinder with the various phases of a cardiac cycle, by auscultating the heart, and recording each sound he heard by a mark on the same rotating drum. Since he had assured himself that he could record the above without any irregularity due to his own reaction-time, he considered that the point on the cardiogram which corresponded with the mark for the first sound of the heart was synchronous with the closure of the auriculo-ventricular valves: the point corresponding to the mark indicating the second sound of the heart he regarded as coincident with the closure of the semilunar valves. Objections were made to the above method, and the possibility of the observer's reaction-time not being zero was left out of account. In answer to these, Dr. Martius has now made some new experiments with a pendulum beating seconds which closed an electric circuit as it passed through the vertical: the current thus produced attracted an armature, made a clapper-like noise, and recorded the instant of its production on a rotating drum. A second circuit was arranged for momentary closure by the observer, yielding a recording mark on the same drum: this circuit was closed regularly each time the clapper was heard, and the two marks made in the way indicated above coincided to within differences of time of at most 0·03 of a second, an exactitude which amply sufficed for the investigation of the cardiograms. It may be remarked here, as a matter of theoretical interest, that the above is not a case really involving reaction-time, but only the recording of known signals which are repeated rhythmically at regularly recurring intervals. With these rhythmic stimulations the duration of the interval is usually *estimated*, and in such cases the variations in the time-value of the estimate are mostly greater than those just quoted. When, however, after some time the rhythm of the stimulations has been fully grasped by the observer, then the interval is no longer estimated, but the record is made with an exactly similar rhythm.

STOCKHOLM.

Royal Academy of Sciences, November 14.—Musci Asiæ borealis, first part, Livermosses, by Prof. G. O. Lindberg and Dr. H. W. Arnell.—The disguise of the *Decapoda oxyrrhina* through special adaptations of the structure of their body, by Dr. Carl Aurivillius.—On the bladders of the Fucaceæ, by Dr. N. Wille.—Mineralogical notes, by Herr G. Flink.—On the journey of Dr. Nansen on the inland ice of Greenland, by Baron Nordenskiöld.—Contributions to the knowledge of the Cestodean worms which occur in Sweden, by Herr E. Lönnberg.—On a monstrous individual of *Cottus scorpius*, by Herr E. Nyström.—Annotations of some Scandinavian Pyrenomycetæ, by Herr K. Starbäck.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

Meteorological Observations at Stations of the Second Order for the year 1884 (Eyre and Spottiswoode).—A Sketch of the First Principles of Physiography: J. Douglas (Chapman and Hall).—Rocks and Soils; H. E. Stockbridge (Trübner).—The Floating Island in Derwentwater: G. J. Symons (Stanford).—Prodromus of the Zoology of Victoria, Decade xvi.: F. McCoy (Trübner).—The Principles of Cancer and Tumour Formation: W. R. Williams (Bale).—The World's Inhabitants: G. T. Bettany (Ward, Lock).—A Treatise on Hydrodynamics, vol. ii.: A. B. Basset (Bell).—Results of Observations at Stonyhurst College Observatory, 1887: Rev S. J. Perry.—Morphologisches Jahrbuch, 14 Band, 3 Heft (Williams and Norgate).

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